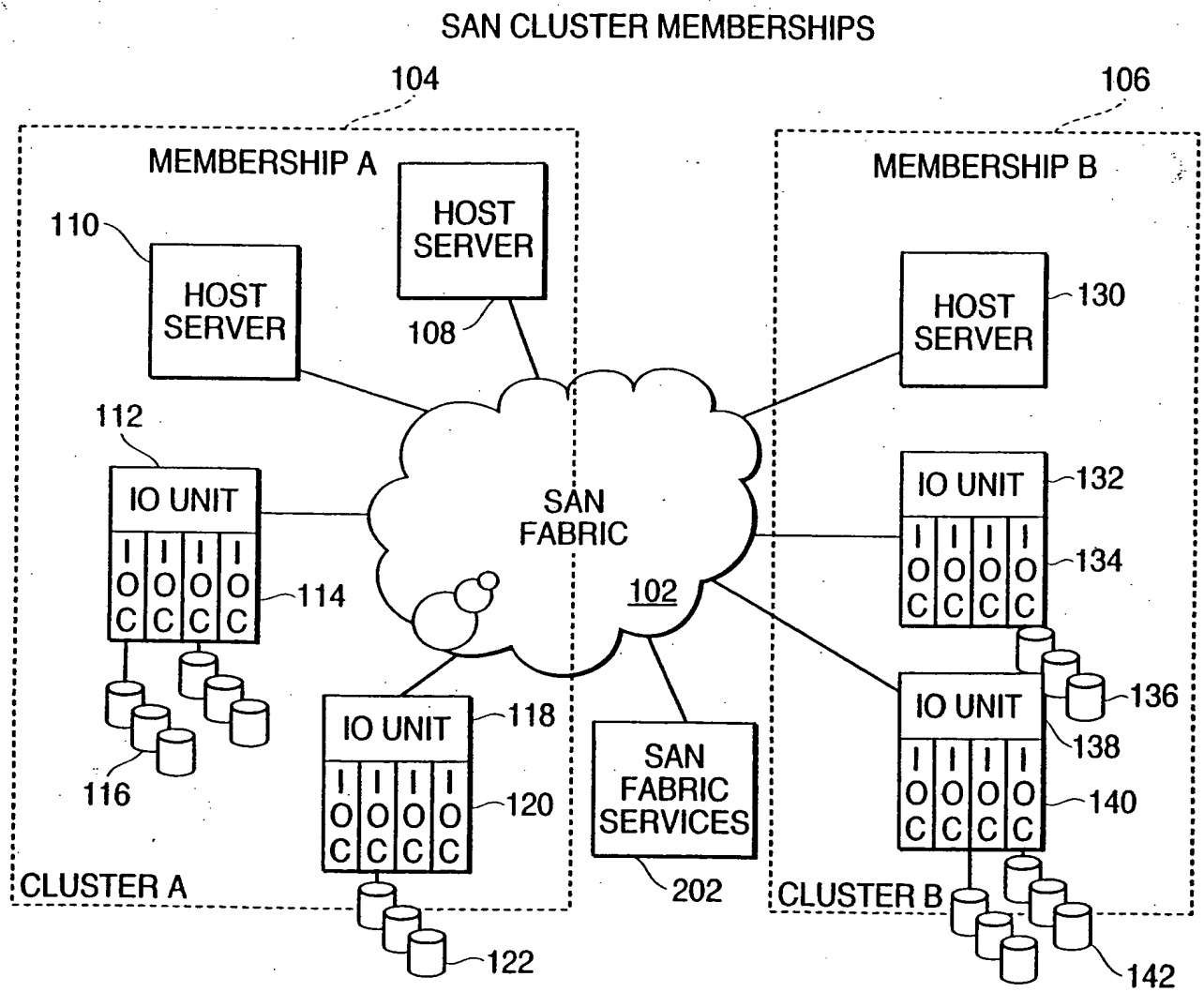
FIG. 1


SAN CLUSTER MEMBERSHIPS
104
106
MEMBERSHIP A
MEMBERSHIP B
110
HOST SERVER
HOST SERVER
108
HOST SERVER
130
112
IO UNIT
IOC IOC IOC IOC
114
SAN FABRIC
102
IO UNIT
132
IOC IOC IOC IOC
134
116
IO UNIT
118
IOC IOC IOC IOC
120
SAN FABRIC SERVICES
202
IO UNIT
136
138
IOC IOC IOC IOC
140
CLUSTER A
CLUSTER B
122
142

100

FIG. 2

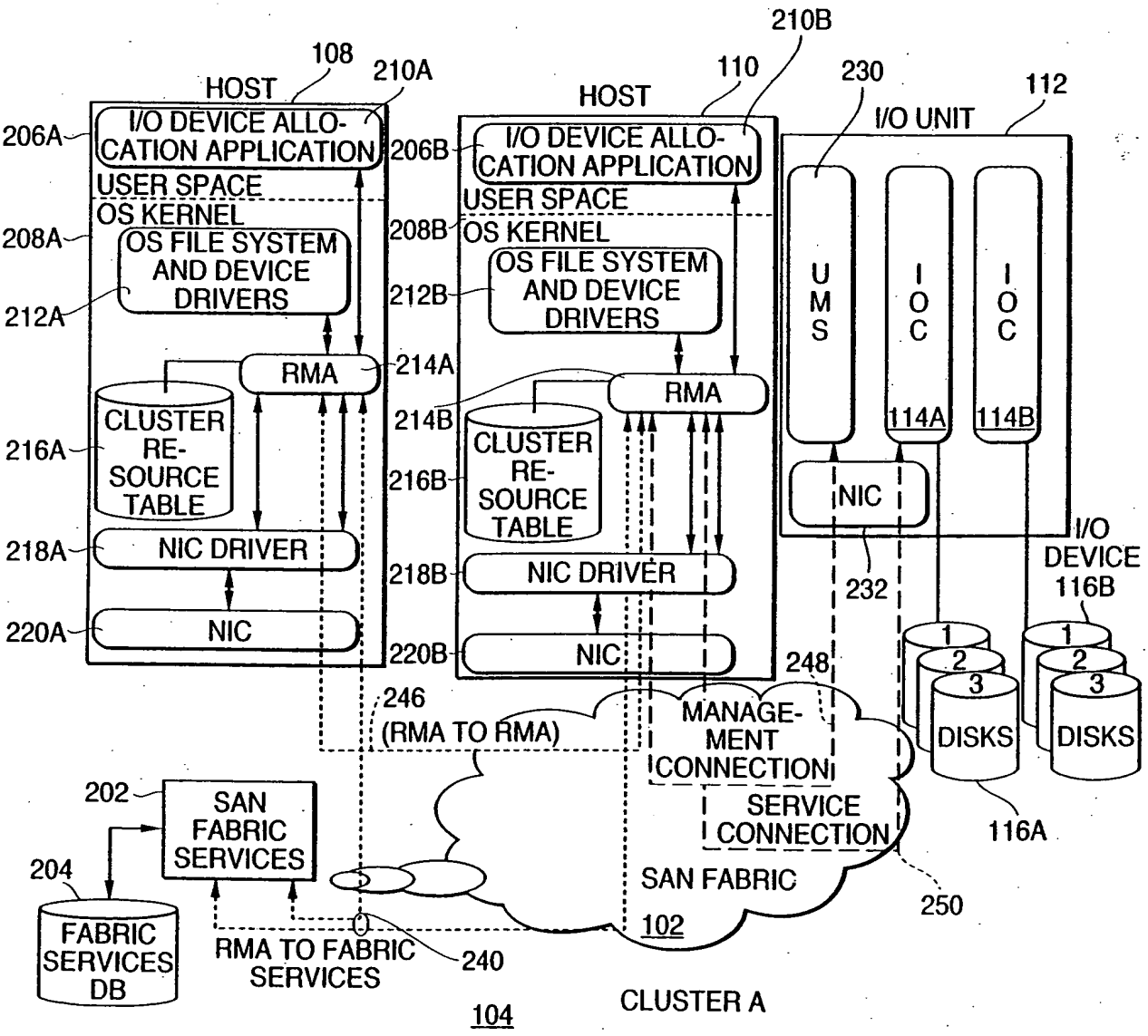

HOST
108
210A
I/O DEVICE ALLO-CATION APPLICATION
206A
USER SPACE
OS KERNEL
208A
OS FILE SYSTEM AND DEVICE DRIVERS
212A
RMA
214A
CLUSTER RE-SOURCE TABLE
216A
NIC DRIVER
218A
NIC
220A
HOST
110
210B
I/O DEVICE ALLO-CATION APPLICATION
206B
USER SPACE
OS KERNEL
208B
OS FILE SYSTEM AND DEVICE DRIVERS
212B
RMA
214B
CLUSTER RE-SOURCE TABLE
216B
NIC DRIVER
218B
NIC
220B
I/O UNIT
230
112
UMS
IOC
114A
IOC
114B
NIC
232
I/O DEVICE 116B
DISKS
DISKS
116A
246
(RMA TO RMA)
248
MANAGE-MENT CONNECTION
SERVICE CONNECTION
250
202
SAN FABRIC SERVICES
204
FABRIC SERVICES DB
RMA TO FABRIC SERVICES
240
SAN FABRIC
102
CLUSTER A
104

FIG. 3

EXAMPLE OF NETWORK TOPOLOGY INFORMATION STORED BY FABRIC SERVICES DATABASE 204

ROW	GUID (302)	DEV. TYPE (304)	MAC ADDR. (306)	CLUSTER (308)	OWNERSHIP (310)
1	HOST108	HOST	ADDR_FOR_108	A	NA
2	HOST110	HOST	ADDR_FOR_110	A	NA
3	I/OU112	I/OUNIT	ADDR_FOR_112	A	SHARED-HOST108,HOST110
4	I/OU118	I/OUNIT	ADDR_FOR_118	A	DED.-HOST 110
5	HOST130	HOST	ADDR_FOR_130	B	NA
6	I/OU132	I/OUNIT	ADDR_FOR_132	B	DED.-HOST130
7	I/OU138	I/OUNIT	ADDR_FOR_138	B	DED.-HOST130

TIME & DATE STAMP (INDICATING TIME AND DATE OF LAST UPDATE BY I/O DEVICE ALLOCATION APPLICATION 210):

314 TIME: 06:32:44
DATE: 05/01/90

FIG. 4

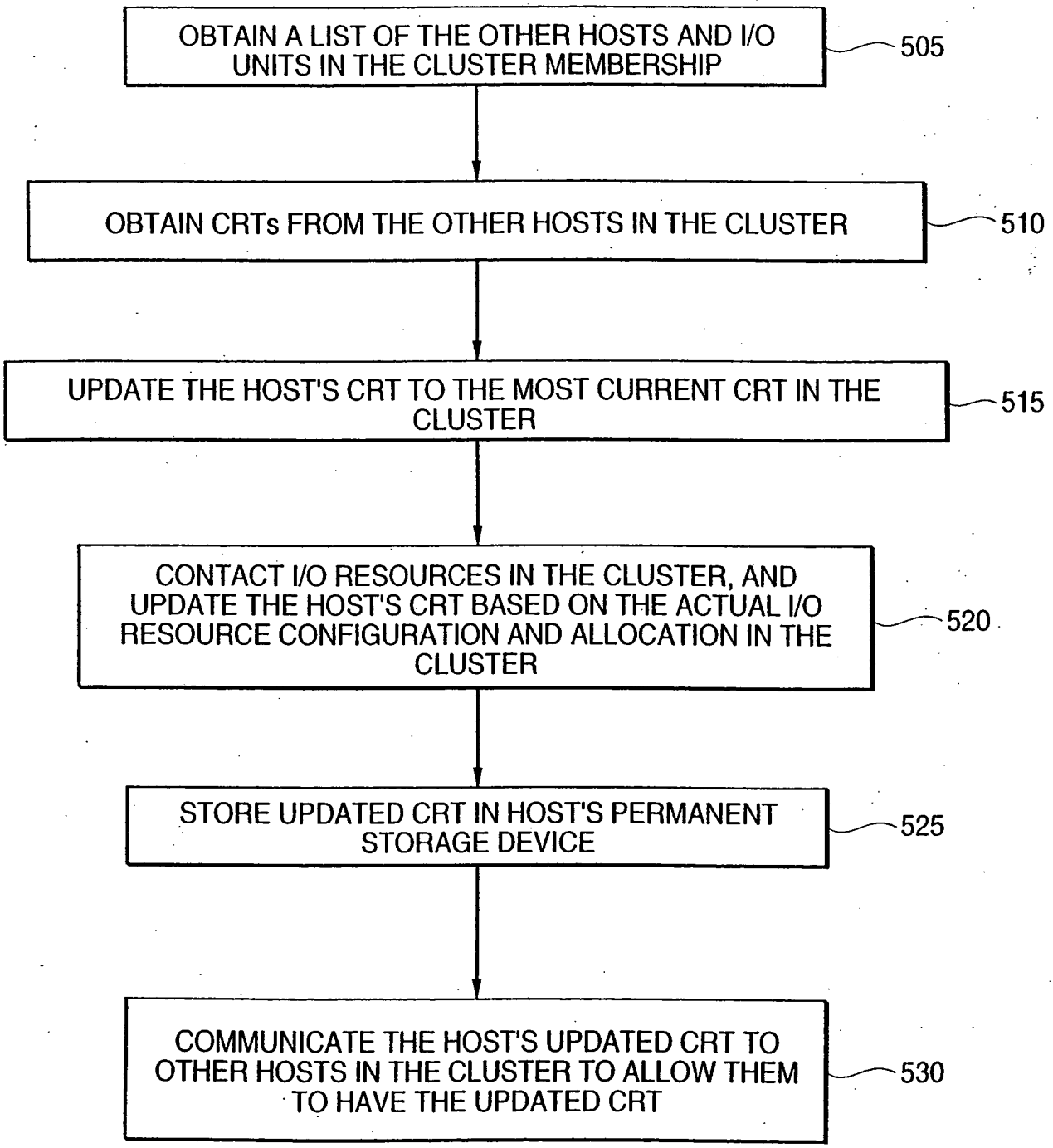
EXAMPLE OF CLUSTER RESOURCE TABLE (CRT) STORED BY A HOST

CLUSTER A

ROW (402)	GUID (404)	TYPE (406)	NIC MAC ADDR. (408)	IOC/IOD NUMBER (410)	PARENT (412)	OWNERSHIP (414)
1	HOST108	HOST	NIC_ADDR_108	NA	CLUSTER A	NA
2	HOST110	HOST	NIC_ADDR_110	NA	CLUSTER A	NA
3	I/OU112	I/OUNIT	NIC_ADDR_112	NA	CLUSTER A	SHARED-HOST108, HOST110
4	I/OC114A	I/O CONTROLLER	NIC_ADDR_112	I/OC1	I/OU112	SHARED-HOST108, HOST110
5	I/OD116A1	I/O D-HDD	NIC_ADDR_112	I/OD1	I/OC114A	DED.-HOST 108
6	I/OD116A2	I/O D-HDD	NIC_ADDR_112	I/OD2	I/OC114A	DED.-HOST110
7	I/OC114B	I/O CONTROLLER	NIC_ADDR_112	I/OC2	I/OU112	SHARED-HOST108, HOST110
8	I/OD116B1	I/O D-HDD	NIC_ADDR_112	I/OD1	I/OC114B	SHARED-HOST108, HOST110
9	I/OU118	I/OUNIT	NIC_ADDR_118	NA	CLUSTER A	DED.-HOST110
10	I/OC120	I/O CONTROLLER	NIC_ADDR_118	I/OC1	I/OU118	DED.-HOST110
11	I/OD122A	I/O D-HDD	NIC_ADDR_118	I/OD1	I/OC120	DED.-HOST110

TIME & DATE STAMP (INDICATING TIME AND DATE OF LAST UPDATE):
TIME: 07:39:44
420 DATE: 05/01/90

FIG. 5


OBTAIN A LIST OF THE OTHER HOSTS AND I/O UNITS IN THE CLUSTER MEMBERSHIP
505
OBTAIN CRTs FROM THE OTHER HOSTS IN THE CLUSTER
510
UPDATE THE HOST'S CRT TO THE MOST CURRENT CRT IN THE CLUSTER
515
CONTACT I/O RESOURCES IN THE CLUSTER, AND UPDATE THE HOST'S CRT BASED ON THE ACTUAL I/O RESOURCE CONFIGURATION AND ALLOCATION IN THE CLUSTER
520
STORE UPDATED CRT IN HOST'S PERMANENT STORAGE DEVICE
525
COMMUNICATE THE HOST'S UPDATED CRT TO OTHER HOSTS IN THE CLUSTER TO ALLOW THEM TO HAVE THE UPDATED CRT
530